Chapter 13

Bioethics

Bioethics

- Bioethics from Greek words "*bios*" *:* life while *ethos* is behavior
- Considered a guide to separate right and wrong, good and evil
- Identify a code of value for our actions, especially towards human
- The area of ethics that deals with the implication of biological research and biotechnological application, especially medicine are called bioethics
- Dilemma-base discipline

Ethical questions??

- To understand how to think about ethics
  - To encourage you to ask questions
  - To think about how to ask the right questions
  - To think how to acquire all the facts
  - To think how to make a decisions based on information rather than emotional reactions

Ethical decision making

- In medicine, Hippochratic Oath : “Do not kill’, “to help or at least do no harm”
- 2 types
  - 1.Ultilitarian from Jeremy Bentham (1748-1832)
  - Aims to produce the greatest good for the greatest number
  - Emphasize consequences

- 2. Deontological approach by Immanuel Kant (1724-1804)
  - Focuses on certain imperatives or absolute principles which we should follow out of a sense of duty and should dictate our duty
  - More objectivism
  - Respect for others
  - Associated with religions

Biotechnology and nature

- DNA recombinant technology: Safety of the techniques and possibly consequences could be assessed
- Guidelines were developed for different levels of bio safety containments depending on the inherent dangers of the experimental system used

The biotechnology debate

- 1. Scientific disagreements
  - Types and degree of risk to human, animal and environmental health
- 2. Political disagreements
  - About the social and economic impacts

- 3. Religious, ethical and philosophical disagreement
  - Often faith based and issue of morality
  - Whatever scientist playing God and biotechnology product are natural

Genetically Modified Crops: Are you what you eat?

- Production of GMO
- Production of plants with special traits such as resistance to pests, disease or harsh climates
- This will allowing better production of crops
- The questions
  - 1. Determine if the alterations in the plant's genetic provide benefit to the plant or at least do not produce less vigorous plants

- Violates any ethical code?

- 2. Possible effect of plants into ecosystems and overall biodiversity
  - Eg. Round-up Ready soybean : herbicide R
  - Bt corn resist to corn borer larvae
    - Possible toxic to monarch butterfly?
    - Whatever the toxin could be spread or confined solely to the corn plant
    - Cross pollination ?

Questions and risk assessment

- How it will be use?
- Whether it is safe to feed to animals?
- Whether it is safe to humans?

- The risk assessment consider the likelihood that something harmful or unintended will happen
  - Evidence and tests to verify its safety
  - Are the gene such as antibiotic R still present in the GM crops?
  - Human exposure to Bt toxin and its safety to the product

- Their safety either in food for consumption of human and animal, as well as environmental
- Detectionof GM crops : Test kit using antibody or DNA test
  - Taco shells and Bt corn may cause allergic reactions
  - Labeling the GM : Public reactions?

Animal Husbandry

- Same concern with GMP
- Antibiotic supplements in foods
- Injection of growth hormones or steroids to increase growth
- Length of time the hormone resides in animal and is it still present in food?
- Safety of animal products and on environmental?

Human and animal Cloning

- Creation of embryos by somatic cell nuclear transfer
- Extremely low survival rate
- Potential identity of the clone?
- Risk and safety factors before and after birth
- Human clone by embryo research? Led to human commercialization, ethical issue?
- Eg. Clone cat name cc

The human questions

- Evoke strong emotions and stir profound controversy
- Anticancer drug treatment : to whom? Type of cancer?
- Hope for the last treatment?
- Dilemma:
  - Informed consent: all information and side effects, potential benefits and risk
  - Placebo effect?
  - Double-blind trial?

Case study

- Thought of pioneer of stem cell : Dr Woo Suk Hwang that claimed of first clone human
- Falsifying the data and allegation of unethical approaches of donated eggs (number of egg and donor), lab did not clone or derived patient-specific stem cells
- Was it ethical for Dr Hwang to collect eggs from junior researchers?. YOU DECIDE.

Economic and communication

- Research companies alike seek to use biotechnology for discoveries that will be profitable and money wise
- How the research proposal are evaluated and their success or contribution to knowledge
- Intellectual properties : the ethical implication and its funding such as new gene constructs, GMOs and embryo

- Consider whether scientist should have unlimited freedom for research?
- Honest communication between the scientist and public
- If they have been misled, the outcomes might be disastrous
- Many ethical questions are very difficult decisions affecting not only yourself but other life's as well